

**UNITED STATES CIVIL DEFENSE**

# **Basic Rescue Course**

**Instructor's Guide IG 14-1**



**DISTRIBUTION STATEMENT A**  
Approved for Public Release  
Distribution Unlimited

**FEDERAL CIVIL DEFENSE ADMINISTRATION**

**20040308 351**

**United States Government Printing Office : January 1956**

For sale by the Superintendent of Documents, U. S. Government Printing Office  
Washington 25, D. C. - Price 30 cents

## CONTENTS

	<i>Page</i>
INTRODUCTION.....	1
SUGGESTIONS TO INSTRUCTOR.....	2
Equipment for training.....	2
Facilities.....	2
COURSE OUTLINE.....	3
LESSON PLANS	
1. Purpose of basic rescue training.....	5
2. Introduction to ropes.....	7
3. Knot tying.....	9
4. Rescue first aid.....	16
5. Casualty handling.....	18
6. Stretcher, lashing and handling.....	22
7. Reconnaissance.....	28
8. Care and use of ladders (Part I).....	31
9. Lifting devices.....	35
10. Appreciation of damage to buildings.....	39
11. Basic fire fighting and limitations.....	44
12. Rescue exercise.....	47
REFERENCES.....	48

## INTRODUCTION

The instructor should have thorough training in the subject but not necessarily experience as an instructor. This guide should be of assistance to those who have had no teaching experience.

Qualified instructors should:

1. Have thorough knowledge of basic rescue as taught at the FCDA Rescue School, Olney, Maryland.

2. Have completed the 10-hour Instructor Training Course No. 3.3, or its equivalent.

To teach this course, the instructor must have completed it himself. Experience in rescue work is not an acceptable substitute.

This guide in basic rescue includes:

SUGGESTIONS TO INSTRUCTOR

COURSE OUTLINE

LESSON AIDS

LESSON PLANS

SUGGESTIONS TO INSTRUCTOR outlines instructor qualifications, suggests instructor aids, and tells how to get ready to instruct in this subject. It suggests advantages of each method of instruction and helps him to decide which he will use. It also suggests some instructional aids.

THE COURSE OUTLINE gives by subject pertinent information such as: length of time, recommended size of class, prerequisites, and code designation for each subject.

LESSON AIDS present course material which may be developed and used by the instructor.

LESSON PLANS blueprint the lessons indicating to the instructor the subjects to be covered and the order to be followed. They list the training materials and references.

## SUGGESTIONS TO INSTRUCTOR

### Instructor Qualifications

The Instructor Training Course No. 3.3 stresses the importance of the following steps in instruction:

1. Introduction.
2. Presentation.
3. Supervision of practice.
4. Testing and followup.

In testing and followup, check sheets are particularly helpful. Following is an example:

*Check Sheet For Climbing Ladders*

	POSITION OF HANDS	POSITION OF FEET	POSITION OF BODY	POSITION OF EYES
Jones.....	O. K.	?	O. K.	O. K.
Smith.....	?	O. K.	?	?
Doe.....	O. K.	?	O. K.	O. K.
Adams.....	O. K.	?	O. K.	O. K.
Kelly.....	O. K.	?	O. K.	O. K.

Use of this chart checks the instructor as well as the learner. When several learners make the same mistake the instructor should question his method of instruction. He should review occasionally course No. 3.3. Since he is dealing with volunteers, he should make every effort to create favorable response, and to hold their interest throughout the course.

### Equipment for Training

The equipment listed in chapter 4 of the Federal Contributions Manual M-25-1 should be used in this course.

### Facilities

The basic rescue training set XI-19 listed in the Federal Contributions Manual M-25-1 should be used. If this is not feasible instructors should ask the help of city officials since they know of buildings being dismantled or torn down and may be able to make them available for the course. It is impossible to give training in this course without adequate training facilities.

## COURSE OUTLINE

**TITLE:** Basic Rescue—Course No. 14.1

**TIME:** 16 hours.

**Recommended number of trainees:** 26

**Recommended for:** Warden neighborhood groups, rescue wardens, and able-bodied civil defense volunteers of all services. It is also a prerequisite for Light Duty Rescue Course.

**Prerequisites:** None. However, a standard first aid course, either American National Red Cross or Bureau of Mines, is highly desirable.

NO.	LESSONS	HOURS
1.	Purpose of the basic rescue training.....	½
2.	Introduction to ropes.....	1½
3.	Knot tying.....	2
4.	Rescue first aid.....	1
5.	Casualty handling (carries, lifts, and drags).....	1
6.	Stretcher, lashing and handling.....	4
7.	Reconnaissance (searching for casualties).....	2
8.	Care and use of ladders (Part I).....	1
9.	Lifting devices.....	1
10.	Appreciation of damage to buildings.....	1
11.	Basic fire fighting and limitations.....	1
12.	Rescue exercise <sup>1</sup> .....	2

<sup>1</sup> Optional.

## **LESSON AIDS**

### **1—Purpose of Basic Rescue Training**

The purpose of a BASIC RESCUE COURSE is to train the greatest number of people to do the less complicated rescue operations effectively before the arrival of the organized rescue squad.

Experience has shown that following a disaster the first people to arrive are willing to assist but, unfortunately, the eagerness and enthusiasm of these untrained rescuers can aggravate a casualty's condition.

This course delineates skills essential to basic rescue workers and precedes the heavier organized rescue training.

Difficult rescue work such as tunneling, breaching, shoring walls, and extrication of victims from other than limited heights is done by trained rescue squads, and should not be attempted by persons instructed only in basic rescue.

Persons trained in basic rescue must be able to direct people during evacuation. Wardens trained in basic rescue may have at their disposal persons similarly trained who can assist in evacuation, in minor traffic jams, and accidents. All basic rescue workers should be qualified in first aid.

## LESSON PLAN NO. 1

COURSE: Basic Rescue—Course No. 14.1  
LESSON TITLE: Purpose of Basic Rescue Training

TIME: ½ hour.

### TRAINING MATERIALS:

Blackboard, eraser, chalk

### REFERENCE:

*Rescue Techniques and Operations*, FCDA, TM-14-1

### MOTIVATION:

This course provides the basic information and training essential to civil defense workers who may be called upon to do rescue work prior to the arrival of, or in the absence of, the organized rescue squads.

MAIN TOPICS	TEACHING POINTS
A. PURPOSE	Information necessary to train workers in light rescue operations.
B. SCOPE OF COURSE	<ol style="list-style-type: none"><li>1. Introduction to ropes, 1½ hour.</li><li>2. Knot tying, 2 hours.</li><li>3. Rescue first aid, 1 hour.</li><li>4. Casualty handling (carries, lifts, and drags) 1 hour.</li><li>5. Stretcher, lashing and handling, 4 hours.</li><li>6. Reconnaissance (searching for casualties) 2 hours.</li><li>7. Care and use of ladders, 1 hour.</li><li>8. Lifting devices, 1 hour.</li><li>9. Appreciation of damage to buildings, 1 hour.</li><li>10. Basic fire fighting, 1 hour.</li><li>11. Rescue exercise (optional) 2 hours. (A total of 16 hours with a suggested exercise requiring 2 hours.)</li></ol>
C. RELATION TO ORGANIZED LIGHT AND HEAVY RESCUE SQUAD	Trained basic rescue people can assess the damage and determine the need for organized rescue squads.
D. RELATION TO WARDEN SERVICE	All wardens should take this course.
E. FIRST AID	A standard first aid course is highly desirable for all person enrolled.

### STUDENT PARTICIPATION:

1. Because of the short time allotted to this lesson, the lecture method will be employed.
2. At the end of the discussion of main topics the instructor should call on different trainees for a brief summary of each.

### HANDOUT MATERIALS AVAILABLE:

None; unless instructor desires to mimeograph some of the information covered.

## LESSON AIDS

### 2—Introduction to Ropes

### 3—Knot Tying

Strength of rope and ability to withstand rough service depend upon several factors:

1. The materials of which it is made.
2. How it is made.
3. How materials and fibers are processed.
4. How rope is used.

Not all loads are straight and smooth pulling.

1. Friction loads are caused by the strands, yarns, and fibers moving in relation to each other to readjust their positions as the rope crosses sheaves or makes other turns.

2. Shock loads are caused by stress being applied or removed abruptly.

Exterior abrasion is caused by dragging or running rope over rough surfaces or sharp objects.

Interior abrasion is caused by cutting action of foreign materials penetrating the fibers, or fibers breaking because of heat generated by rapid movement over sheaves, etc.

Since lives will depend on the condition of rope used in rescue operations it should be inspected regularly for:

#### *Surface defects*

1. Broken fibers.
2. Wear.
3. Cuts.

#### *Internal defects*

1. Broken fibers (inspect by untwisting strands).
2. Mildew or mould (inspect by untwisting strands).
3. Change in color of fibers.



## LESSON PLAN NO. 2

COURSE: Basic Rescue—Course No. 14.1

LESSON TITLE: Introduction to Ropes

TIME: 1½ hours

### TRAINING MATERIALS:

- Two ¾" x 100' manila ropes
- One ½" x 50' manila rope per 2 trainees
- One coil manila rope (any size) as packaged by manufacturer
- Samples of damaged ropes
- Can of varnish, shellac, or lacquer
- Ball of whipping cord
- One coiling frame
- 35 mm. slide projector and screen, optional
- Filmstrip: "Ropes and Knot Tying—Part I" (STF-1), optional

### REFERENCES:

- Rescue Techniques and Operations*, FCDA, TM-14-1, chapter 2
- Skills Training Films*, FCDA, IG-3-1

### MOTIVATION:

Rope is one of the most important tools of the rescue service. The efficiency with which rope can be used will depend to a great extent on proper care and maintenance.

MAIN TOPICS	TEACHING POINTS
<p>A. PURPOSE</p> <p>B. TERMINOLOGY</p>	<p>To teach trainee how to care for rope.</p> <ol style="list-style-type: none"> <li>1. Manila rope—standard rope. Light yellow in color, hard but pliant with a silvery luster and smooth waxy surface.</li> <li>2. Size of rope—diameter.</li> <li>3. Yarns—fibers twisted to the right.</li> <li>4. Strands—yarns twisted to the left.</li> <li>5. Rope—three or more strands twisted together.</li> <li>6. Free end of rope—generally the end used in tying a knot, or the working end of the rope.</li> <li>7. Standing part—that part of the rope taking the load, fixed or anchored.</li> <li>8. Tail—the running end of the rope left over after a knot is tied.</li> <li>9. Bight-in-rope—a bend in rope with parallel sides.</li> <li>10. Round turn—formed by looping the running part of a rope over an object or over the standing part.</li> <li>11. Whipping—process of wrapping end of rope to prevent unraveling.</li> <li>12. Haul away—to pull on a rope.</li> <li>13. Slack off—to let out the rope.</li> </ol>

MAIN TOPICS	TEACHING POINTS
C. UNCOILING NEW ROPE	Look for large arrow printed on burlap covering. If no arrow appears on burlap, reach into coil for end of rope tagged with instructions.
D. CARE OF ROPE	<ol style="list-style-type: none"> <li>1. Stretch new rope its entire length before use for easy handling.</li> <li>2. Whip or temporarily knot ends to prevent fraying.</li> <li>3. Keep rope dry, if possible. If it gets wet, do not dry with heat but stretch on ladders, coil loosely, or suspend from supports so that air can reach fibers.</li> <li>4. Do not drag rope over ground or sharp edges.</li> <li>5. Avoid getting oil, grease, acids, or strong alkalis on rope.</li> <li>6. Keep rope coiled when not in use.</li> <li>7. Store ropes off the ground in well-ventilated room, free from extreme temperatures.</li> </ol>
E. INSPECTION	Inspect rope after use. (Demonstrate).
F. WHIPPING ROPE	<ol style="list-style-type: none"> <li>1. See figure 3, Method of Whipping Rope, FCDA, TM-14-1, p. 15. (Demonstrate).</li> <li>2. Dip whipped end in shellac, varnish, or lacquer.</li> </ol>
G. HAND COILING AND UNCOILING	<ol style="list-style-type: none"> <li>1. Demonstrate hand coil for ropes of 50 feet or less.</li> <li>2. Demonstrate coiling rope on ground or floor for longer or larger ropes.</li> </ol>
H. RESCUE COIL	<p>A rescue coil is compact and easily carried on rescuer's back. When dropped from heights it uncoils without kinking, and its descent is quick and accurate.</p> <ol style="list-style-type: none"> <li>1. Demonstrate and explain making coil.</li> <li>2. Remove coil from rack and adjust to trainee's back.</li> <li>3. Remove coil from trainee's back and uncoil rope to prove no kinks result.</li> <li>4. Have trainees make rescue coil.</li> </ol>
I. SAFE WORKING LOAD	<p>A thumb rule for estimating safe working load: <math>(\text{Diameter of rope})^2 \times 2,000 \text{ lbs.} = \text{S. W. L.}</math></p> <p>Example: For a <math>\frac{1}{2}</math>" manila rope: <math>(\frac{1}{2})^2 \times 2,000 \text{ lbs.} = \text{S. W. L.}</math>  <math>\frac{1}{4} \times 2,000 = 500 \text{ lbs. S. W. L.}</math></p>

#### STUDENT PARTICIPATION:

1. Each trainee should examine damaged rope and give probable cause of damage.
2. Each trainee should examine several pieces of rope and give their sizes.
3. Check students on terminology.
4. Each trainee should whip ends of a rope.
5. Each trainee should hand coil a rope.
6. Each trainee should make a rescue coil.

#### HANDOUT MATERIALS AVAILABLE:

Many manufacturing companies supply pamphlets on request. Instructors may obtain handout material by applying to them.

## LESSON PLAN NO. 3

COURSE: Basic Rescue—Course No. 14.1  
 LESSON TITLE: Knot Tying

TIME: 2 hours

### TRAINING MATERIALS:



- One ½" x 50' manila rope per trainee
- Hitching rails
- Filmstrip projector and screen, optional
- Filmstrip: "Ropes and Knot Tying—Parts I and II" (STF-1), optional


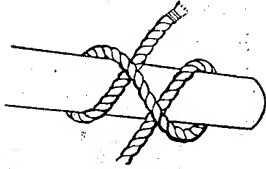
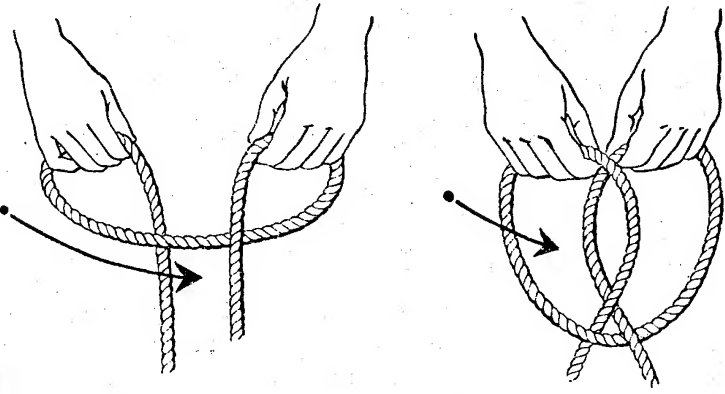
### REFERENCES:

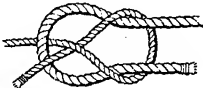
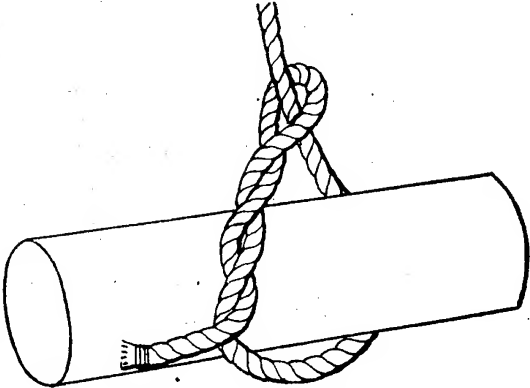
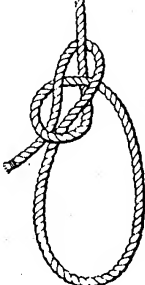
- Rescue Techniques and Operations*, FCDA, TM-14-1, chapter 2
- Skills Training Films*, FCDA, IG-3-1

### MOTIVATION:

Knots listed in this lesson plan are all that are needed in rescue work. Knots must be tied so that the trainee would stake his life on their ability to hold. Each trainee should be able to tie all these knots even when blindfolded.

MAIN TOPICS	TEACHING POINTS
A. OVERHAND KNOT	<ol style="list-style-type: none"> <li>1. Tie overhand knot in end of rope.</li> <li>2. Explain that this is used when time will not permit whipping.</li> </ol> <div style="text-align: center;">  <p>FIGURE 1.—Thumb knot.</p> </div>
B. FIGURE "8" KNOT	<p>Discuss its advantages over the thumb knot.</p> <div style="text-align: center;">  <p>FIGURE 2.—Figure "8" Knot.</p> </div>

MAIN TOPICS	TEACHING POINTS
C. HALF HITCH	<ol style="list-style-type: none"> <li>1. The half hitch is the basis of many knots.</li> <li>2. Form half hitch over hitching rack. This hitch is necessary in stretcher lashings.</li> </ol>  <p data-bbox="758 645 972 671">FIGURE 3.—Half hitch.</p>
D. CLOVE HITCH AT END OF ROPE	<p>Demonstrate the clove hitch—a combination of two half hitches.</p> <ol style="list-style-type: none"> <li>a. The clove hitch is used to make fast to an object such as a post, pole, or pipe. It holds firm and can be untied even after being heavily loaded.</li> <li>b. This clove hitch is used in stretcher lashings.</li> <li>c. To insure safety, add a safety knot.</li> </ol>  <p data-bbox="744 1103 972 1129">FIGURE 4.—Clove hitch.</p>
CLOVE HITCH IN MIDDLE OF A ROPE	<p>Since it is frequently necessary to tie a clove hitch in the middle of a rope, demonstrate throwing the clove hitch over the end of an object.</p>  <p data-bbox="598 1658 1118 1684">FIGURE 5.—Making clove hitch in middle of rope A-B.</p>

MAIN TOPICS	TEACHING POINTS
E. SHEET BEND OR BECKET BEND	<ol style="list-style-type: none"> <li>1. Explain that the becket or sheet bend is used to tie or join two ropes together. Show that it will not slip and is easily untied without damaging the rope.</li> <li>2. Demonstrate a double becket bend. It provides greater security, particularly when the rope is wet.</li> </ol>  <p>FIGURE 6.—Sheet bend or becket.</p>
F. TIMBER HITCH	<ol style="list-style-type: none"> <li>1. Demonstrate the ease and speed with which a timber hitch can be tied and untied.</li> <li>2. It is useful for hauling or raising timber.</li> </ol>  <p>FIGURE 7.—Timber hitch.</p>
G. BOWLINE IN FRONT OF THE HAND	<ol style="list-style-type: none"> <li>1. The bowline is a good secure knot. The bowline <i>in front of the hand</i> is the basis for other variations.</li> </ol>  <p>FIGURE 8.—Bowline.</p>

# MAIN TOPICS

BOWLINE BEHIND THE HAND

BOWLINE ON A BIGHT

DOUBLE BOWLINE OR LIFE BASKET

# TEACHING POINTS

2. Explain that the bowline is used for convenience and speed, and dresses in the correct manner under load. Demonstrate tying this knot.
3. Demonstrate that the bowline on a bight is tied to provide: A double loop at any point in a slack line without involving either end of the line, or a double loop at the end of the line. This knot is most useful in lowering a stretcher horizontally.

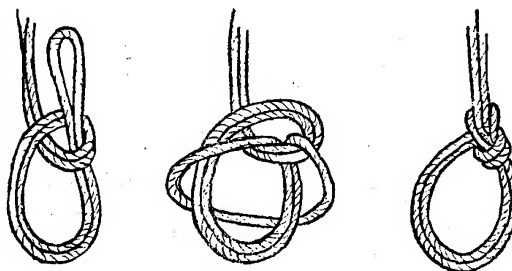


FIGURE 9.—Bowline on a bight.

4. The double bowline is useful for making three loops in a rope and as a safe life basket for moving an unconscious person.

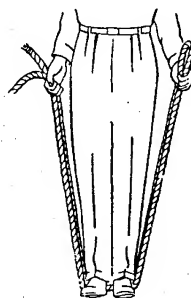


FIGURE 10a.—Double bowline or life basket.

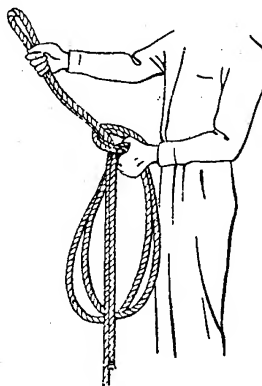


Figure 10b

MAIN TOPICS

TEACHING POINTS



Figure 10c

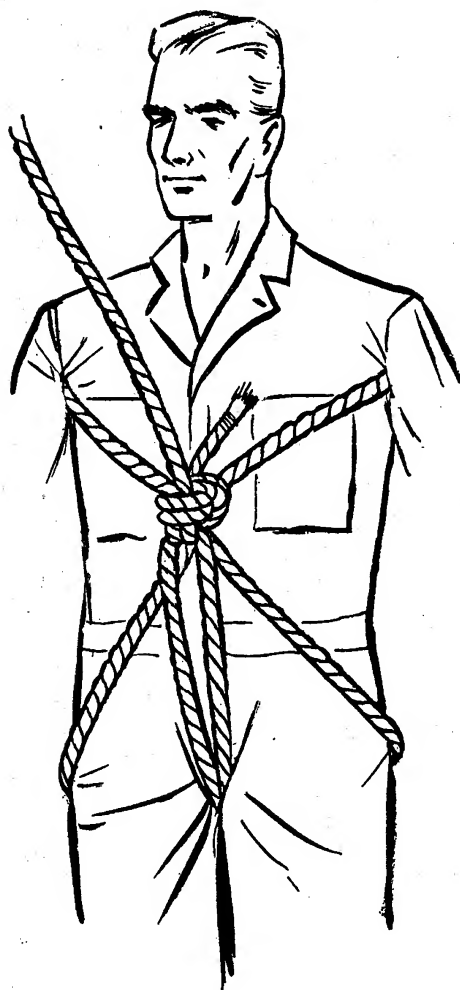
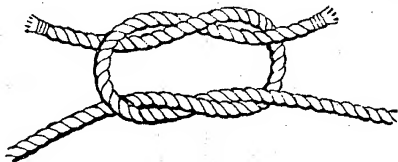


Figure 10d

MAIN TOPICS	TEACHING POINTS
BOWLINE IN A BIGHT PLUS CHEST HITCH H. SQUARE KNOT	<p>5. Demonstrate this hitch.            Trainee should practice it.            Demonstrate how a square knot is used for tying bandages in first aid.</p>  <p>FIGURE 11.—Square knot.</p>

#### STUDENT PARTICIPATION:

1. Sequence to be followed:
  - a. Instructor discusses the knot.
  - b. He demonstrates how to tie the knot.
  - c. The trainee ties the knot.
  - d. The instructor inspects the knot.
  - e. Trainee repeats the tying of knots 1 and 2 before taking up knot 3; 1, 2, and 3 before going to knot 4.
2. Trainees will be blindfolded and tie all knots.
3. Depending on time, facilities, and progress, the instructor may desire to use filmstrips listed in training materials either as an introduction or as a summary.
4. Trainees should be encouraged to perfect their knot tying skill.

#### HANDOUT MATERIALS AVAILABLE:

Many manufacturing companies supply pamphlets on request. Instructors may obtain handout material by applying to them.



## LESSON AIDS

### 4—Rescue First Aid

### 5—Casualty Handling

### 6—Stretcher, Lashing and Handling

#### OBJECTIVES OF THIS TRAINING

1. Determining nature of injury and giving preliminary first aid.
2. Making the victim as comfortable as possible.
3. Teaching recommended methods of handling and transporting casualties.

Seriously injured casualties should be protected from shock during all phases of rescue. Measures to prevent or reduce shock:

1. Stop bleeding by first aid.
2. Preserve body warmth—casualties should be covered as soon as possible.
3. Talk to the casualty—seriously injured persons become frightened and excited about their condition, thereby increasing shock. Reassure him that everything possible is being done for him.
4. Give water or saline solution if the casualty is in fairly good condition. It is not advisable to give fluids to casualties not fully conscious, those with abdominal wounds, or those where immediate surgery is indicated.

In case of severe bleeding place the victim with head lowered unless he is bleeding from the head. He should be kept at rest, as movements of the body may interfere with clot formation or dislodge a clot formed. Give him plenty of fresh air, water if he is conscious, and keep him warm.

The common causes of respiratory failure requiring artificial respiration are drowning, suffocation, and electric shock. The generally accepted method prior to 1951 was the "push the air out" method, depending on the elastic recoil of the chest and internal organs for air to be drawn into the diaphragm action. With the threat of nerve gas and its paralyzing effect on the lungs, came the need for a "push and pull" method of artificial respiration. The back-pressure arm-lift method meets this need. It gives the casualty twice as much air as former methods and is not only simple, but much less tiring.

Make a careful examination of the injured person. Do not attempt to move him except to prevent further injury or to save his life. Careless handling of a simple fracture may increase pain and shock, cause complications that will prolong the period of disability, and even endanger life through hemorrhage. The general symptoms of fracture are:

1. Pain in region of fracture.
2. Loss of member function.
3. Swelling of member.

It is important that rescuers be able to recognize the symptoms of burns to administer first aid. If not properly cared for, burns may cause serious complications.

## LESSON PLAN NO. 4

COURSE: Basic Rescue—Course No. 14.1  
LESSON TITLE: Rescue First Aid

TIME: 1 hour

### TRAINING MATERIALS:

One first aid kit per 4 trainees.

Blankets (2 per stretcher)

Splints

Filmstrip projector and screen (optional)

Filmstrip: "Emergency First Aid" (STF-11) optional

### REFERENCE:

*American Red Cross First Aid Textbook and Supplement #1*

### MOTIVATION:

Rescue workers, while extricating victims, can prevent aggravation of injuries and save lives by using first aid techniques. These include controlling bleeding, giving artificial respiration, splinting fractures, and treating shock. This lesson does not replace regular instruction in first aid, but is intended as a review. Everyone taking this course should have had a standard first aid course.

MAIN TOPICS	TEACHING POINTS
A. PURPOSE	1. To teach the fundamentals of first aid. 2. To teach proper handling of trapped casualties. 3. To teach trainees to recognize injuries by symptoms.
B. SCOPE	Subjects to be taught: Control bleeding. Artificial respiration. Fractures. Burns. Shock.
C. BLEEDING	Explain types of bleeding: Arterial. Venous. Capillary. Explain how they can be controlled: By direct pressure. By digital pressure. By tourniquet. Demonstrate pressure points to trainees.

MAIN TOPICS	TEACHING POINTS
D. ARTIFICIAL RESPIRATION	Explain and demonstrate methods of artificial respiration: 1. Schafer method. 2. Sylvester method. 3. Back-pressure arm-lift method.
E. FRACTURES	1. Fractures are classified as: a. Simple fractures (define). b. Compound fractures (define). 2. General symptoms. 3. Bandages. 4. Splints. 5. Transportation (discussed in Lesson Plan No. 5)
F. BURNS	1. Define. 2. Classify. a. First degree. b. Second degree. c. Third degree. 3. First aid.
G. SHOCK	1. Define. 2. Explain causes. 3. Identify symptoms. 4. First aid.

#### STUDENT PARTICIPATION:

1. Encourage students to ask questions.
2. Encourage students to answer questions.
3. Have students take role of casualties.
4. Have students take role of first aiders.

#### HANDOUT MATERIALS AVAILABLE:

Handout material may be obtained from the American National Red Cross upon request.  
Enrollment data for Standard First Aid Course.

## LESSON PLAN NO. 5

COURSE: Basic Rescue—Course No. 14.1  
 LESSON TITLE: Casualty Handling  
 (Pickups, carries, and drags)

TIME: 1 hour

### TRAINING MATERIALS:

Filmstrip projector and screen, optional  
 STF-3 (pickups, carries, and drags), optional  
 STF-7 Using ladders in rescue optional  
 Standard first aid kit  
 Chair  
 Blankets  
 Sample emergency medical tags  
 28' Extension ladder per 12 trainees  
 Two-story building

### REFERENCES:

*Rescue Techniques and Operations*, FCDA, TM-14-1  
*American Red Cross First Aid Textbook*  
*Organization and Operation of Civil Defense Casualty Services*, Part III—*Medical Records for Casualties*,  
 FCDA, TM-11-3  
*Skills Training Films*, FCDA, IG-3-1.

### MOTIVATION:

Rescue people should remove casualties from dangerous areas using methods which will not aggravate the injury or cause further injury.

MAIN TOPICS	TEACHING POINTS
A. PURPOSE	1. To give trainees practical experience in casualty handling techniques.
B. SCOPE	2. To teach trainees the importance of proper rescue methods. This includes: <ol style="list-style-type: none"> <li>a. Crutch assist method.</li> <li>b. Seat carry.</li> <li>c. Fore and aft carry.</li> <li>d. Chair litter carry.</li> <li>e. Three-man carry.</li> <li>f. Fireman's drag.</li> <li>g. Incline drag.</li> <li>h. Helping persons down ladder.</li> <li>i. Use of emergency medical tag.</li> </ol>

MAIN TOPICS	TEACHING POINTS
C. CRUTCH ASSIST METHOD	<ol style="list-style-type: none"> <li>1. Used to assist a slightly injured conscious casualty.</li> <li>2. Demonstrate (see TM-14-1, fig. 66, p. 82).</li> <li>3. A one-man assist is given on the victim's injured side.</li> <li>4. Two-man assist may be used.</li> <li>5. Trainees pair off and practice.</li> </ol>
D. SEAT CARRY	<ol style="list-style-type: none"> <li>1. Used when casualty's injury will not permit him to walk.</li> <li>2. Requires two rescue men.</li> <li>3. Demonstrate (see TM-14-1, fig. 71, p. 86).</li> <li>4. Trainees practice.</li> </ol>
E. FORE AND AFT CARRY	<ol style="list-style-type: none"> <li>1. Should not be used for leg or back injuries.</li> <li>2. Requires two rescue men.</li> <li>3. Demonstrate (see TM-14-1, fig. 72, p. 86).</li> <li>4. Trainees practice.</li> </ol>
F. CHAIR LITTER CARRY	<ol style="list-style-type: none"> <li>1. Used when chair is available.</li> <li>2. Demonstrate (see TM-14-1, fig. 73, p. 86).</li> <li>3. Trainees practice.</li> </ol>
G. THREE-MAN CARRY	<ol style="list-style-type: none"> <li>1. Used to carry severely injured casualty.</li> <li>2. Three rescue men line up on one side of casualty, preferably the tallest at the shoulders, one at hips, and one at knees.</li> <li>3. They kneel on knee nearest casualty's feet.</li> <li>4. They work hands under casualty.</li> <li>5. Lifting is done in three counts.</li> <li>6. Demonstrate (see TM-14-1, fig. 74, p. 87).</li> </ol>

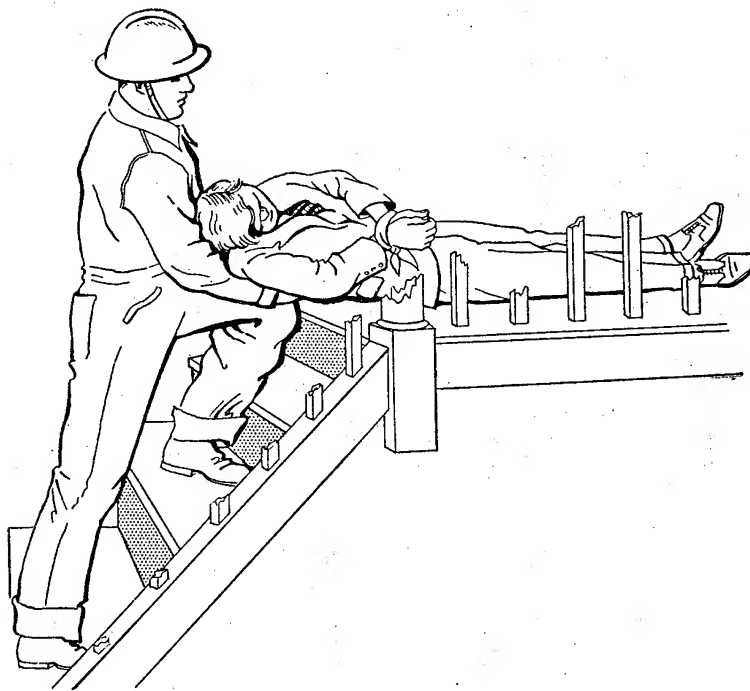


FIGURE 12.—Incline drag.

MAIN TOPICS	TEACHING POINTS
H. FIREMAN'S DRAG	<ol style="list-style-type: none"> <li>1. Used to move an unconscious casualty.</li> <li>2. Recommended in tunnels and other limited spaces, or in atmospheres where it is necessary to remain close to the ground to obtain an adequate supply of oxygen.</li> <li>3. Demonstrate (see TM-14-1, fig. 67, p. 83).</li> <li>4. Trainees practice.</li> </ol>
I. INCLINE DRAG	<ol style="list-style-type: none"> <li>1. Used to ease casualty down a stairway or incline.</li> <li>2. May be used to move an unconscious casualty.</li> <li>3. Demonstrate (see TM-14-1, fig. 70, p. 85).</li> <li>4. Since this method requires the rescuer to descend the stairs backward, he should be guided.</li> <li>5. Contact with rickety railings should be avoided.</li> <li>6. Trainees pair off and practice.</li> </ol>
J. HELPING PERSON DOWN LADDER.	<ol style="list-style-type: none"> <li>1. Casualty is conscious and uninjured.</li> <li>2. Instilling in casualty confidence in rescuer.</li> <li>3. Have one man at heel of ladder.</li> </ol>

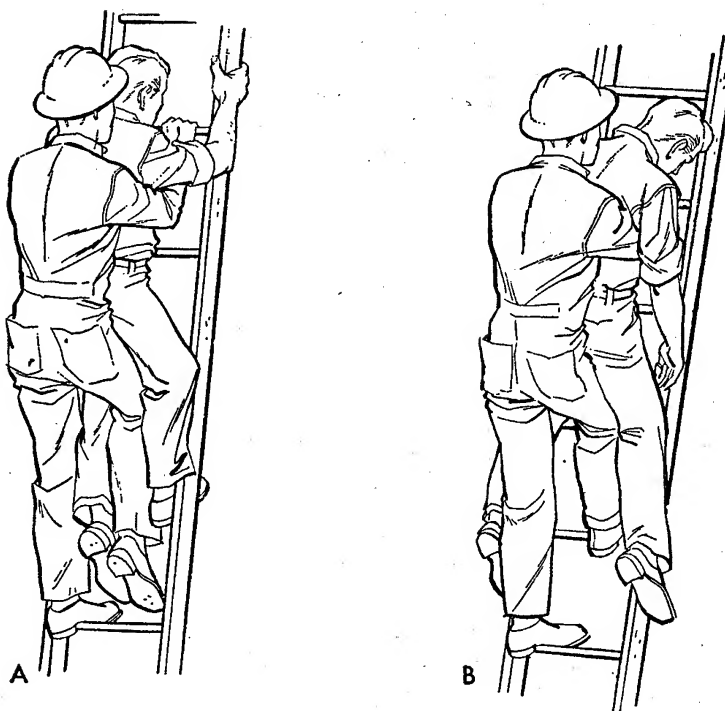


FIGURE 13.—Helping person down ladder A, B.

4. Demonstrate.
5. Trainees pair off and practice, each in (1) role of casualty and (2) role of rescue man.

MAIN TOPICS	TEACHING POINTS
K. USE OF EMERGENCY MEDICAL TAG.	<ol style="list-style-type: none"> <li>1. Used for person initially examined or treated by the rescuer.</li> <li>2. Tag should be legibly written and securely attached to casualty.</li> <li>3. Discuss use of emergency medical tag with the trainees. Impress on them its importance (see TM-11-3).</li> </ol>

**STUDENT PARTICIPATION:**

After explanation and demonstration on each type of rescue or handling, the trainee should repeat the demonstration under instructor's supervision.

**HANDOUT MATERIALS AVAILABLE:**

None.

## LESSON PLAN NO. 6

COURSE: Basic Rescue—Course No. 14.1

LESSON TITLE: Stretcher, Lashing and Handling

TIME: 4 hours

### TRAINING MATERIALS:

- One stretcher per 8 trainees
- Two blankets per stretcher
- Two 28' extension ladders per class
- Two 10' wall ladders per class
- One ½" x 50' lashing rope per trainee
- Two ¾" x 100' rope per class
- Four iron stakes per class
- A two-story facility

### REFERENCE:

*Rescue Techniques and Operations, FCDA, TM-14-1.*

### MOTIVATION:

Improper or careless methods may increase the severity of the injury. The rescuer must recognize the injury and handle accordingly. In close and uncomfortable working areas the rescuer should make every movement count.

MAIN TOPICS	TEACHING POINTS
A. PURPOSE	<p>To teach:</p> <ul style="list-style-type: none"> <li>Blanketing of stretchers.</li> <li>Stretcher lashing techniques.</li> <li>Stretcher carrying.</li> <li>Lowering of stretchers.</li> </ul>
B. SCOPE	<ol style="list-style-type: none"> <li>1. Stretcher nomenclature.</li> <li>2. Blanketing.</li> <li>3. Lashing.</li> <li>4. Transportation.</li> <li>5. Rescue from limited heights:               <ul style="list-style-type: none"> <li>a. Vertical.</li> </ul> </li> <li>6. Stokes stretcher, optional.</li> <li>7. Improvised stretchers.</li> </ol>
C. NOMENCLATURE	<ol style="list-style-type: none"> <li>1. Beams or poles.</li> <li>2. Canvas bed.</li> <li>3. D's.</li> <li>4. Spreaders.</li> <li>5. Handles.</li> </ol>
D. BLANKETING	<ol style="list-style-type: none"> <li>1. Warmth.</li> <li>2. Comfort.</li> <li>3. Protection from roughness of rope.</li> <li>4. Provides feeling of security.</li> </ol>
1. PURPOSES	



MAIN TOPICS	TEACHING POINTS
2. STEPS	<ol style="list-style-type: none"> <li>1. Starting at head of stretcher, center first blanket lengthwise across with edge of blanket even with tips of handles.</li> <li>2. Demonstrate centering second blanket lengthwise with the stretcher about 2 feet from edge of first blanket at head.</li> <li>3. Place casualty on stretcher.</li> <li>4. Form cuff over feet.</li> <li>5. Fold one side of second blanket over body.</li> <li>6. Fold other side of same blanket over body and tuck in excess.</li> <li>7. Keep the blanketing as shown in figure 14, a, b, c, d.</li> </ol>

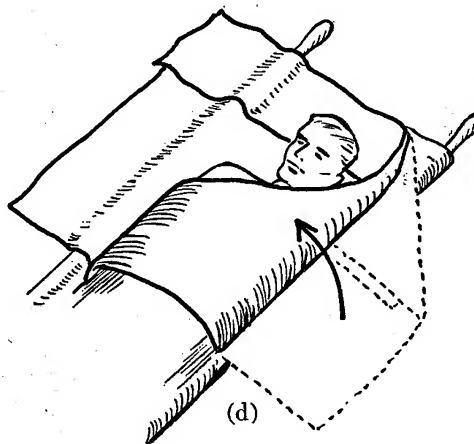
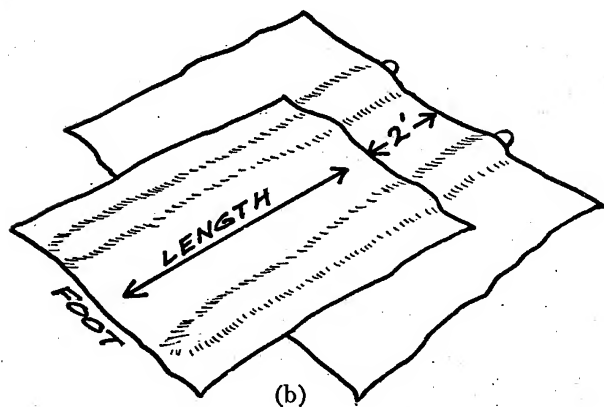
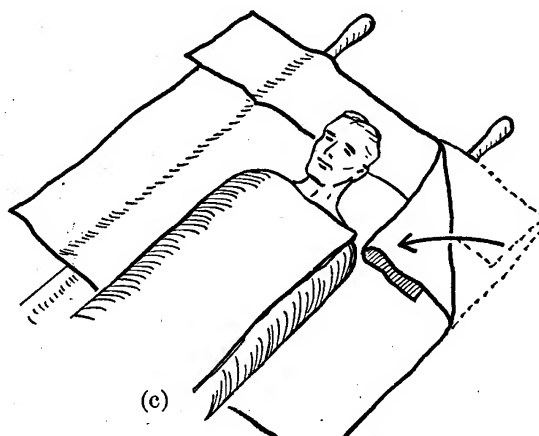
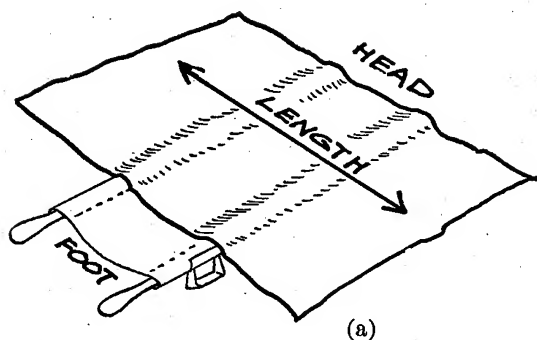


FIGURE 14.—Stretcher blanketing.

MAIN TOPICS	TEACHING POINTS
E. LASHING	<p>Casualty will be lashed to the stretcher whenever there is any danger of his rolling off in transport.</p> <ol style="list-style-type: none"> <li>1. Work in teams of two (one man on each side of stretcher).</li> <li>2. Begin with clove hitch on either handle at head of stretcher. For security, tie a safety knot to complete this step.</li> <li>3. Carry coiled lashing line along the beam to casualty's chest.</li> <li>4. Pass coil over casualty's chest to helper on opposite side who passes it back underneath the stretcher.</li> <li>5. Complete a half hitch.</li> <li>6. Repeat the same sequence for two more half hitches across the casualty, one across the abdomen and the other just above the knees. The injury will determine the exact location of all lashings.</li> <li>7. Tie a half hitch around casualty's ankles with a second hitch supporting the insteps.</li> <li>8. Bring the line back on other side close to the beam forming half hitches over each of the three body lashings.</li> <li>9. Finish off the lashing with a clove hitch and safety on handle opposite the one at which you started.</li> <li>10. Any extra line should be tucked under the body lashing in the form of a loop with the end projecting out from the lashing at the chest and toward the shoulder for ease of removal.</li> </ol>
F. TRANSPORTATION	<ol style="list-style-type: none"> <li>1. Two-man stretcher carry. <ol style="list-style-type: none"> <li>a. One man at head and one at foot.</li> <li>b. To prevent straining back two men should kneel and lift, favoring the back. Keep back straight, but not necessarily vertical.</li> <li>c. Casualty should be carried feet first except uphill or upstairs.</li> <li>d. Bearers should walk in cadence but not in step.</li> </ol> </li> <li>2. Four-man carry. <ol style="list-style-type: none"> <li>a. One man at each handle.</li> <li>b. One man at head, one at foot, and one on each side.</li> </ol> </li> </ol>

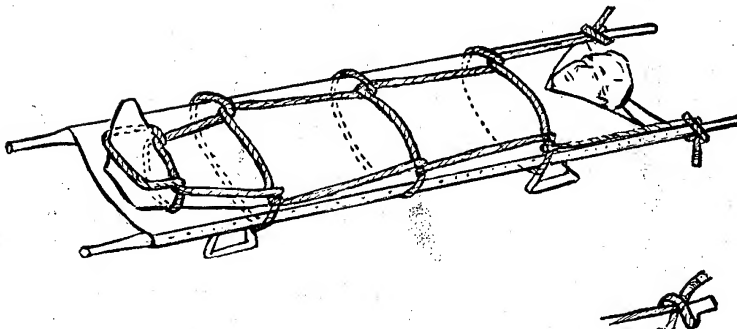


FIGURE 15.—Stretcher lashings.

MAIN TOPICS	TEACHING POINTS
G. RESCUE FROM LIMITED HEIGHTS	<ol style="list-style-type: none"> <li>1. Vertical lower from second story window.               <ol style="list-style-type: none"> <li>a. Lowering of stretcher over window sill:                   <ol style="list-style-type: none"> <li>(1) <math>\frac{3}{4}</math>" rope through D-rings with a clove hitch at each handle.</li> <li>(2) Requires at least two men in room from which casualty is lowered.</li> <li>(3) Bowline behind the hand used.</li> <li>(4) Proper anchorage.</li> <li>(5) Two guide lines controlled by men below.</li> </ol> </li> </ol> </li> </ol>
H. STOKES STRETCHER (OPTIONAL)	<ol style="list-style-type: none"> <li>1. Explain the use of the Stokes stretcher and point out its advantages and disadvantages.</li> </ol>
I. IMPROVISED STRETCHER	<ol style="list-style-type: none"> <li>1. Ladder used as stretcher.               <ol style="list-style-type: none"> <li>a. Place board across rungs for comfort.</li> <li>b. Blanket same as for stretcher.</li> <li>c. Use tarpaulin (see TM-14-1, fig. 82, p. 94).</li> <li>d. Start lashing with a clove hitch around ladder beam (rung just above shoulders splits the clove hitch). Balance of lashing is same as for stretcher.</li> </ol> </li> <li>2. Other improvised stretchers.               <ol style="list-style-type: none"> <li>a. Door.</li> <li>b. Blankets and poles.</li> </ol> </li> </ol>

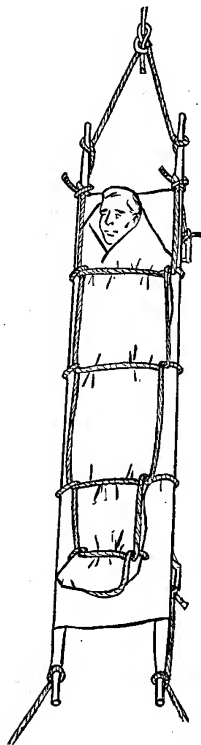


FIGURE 16.—Vertical lower.

**STUDENT PARTICIPATION:**

Each trainee should be required to do each operation.

---

**HANDOUT MATERIALS AVAILABLE:**

None.

## LESSON AIDS

### 7—Reconnaissance

In making his reconnaissance the rescuer should keep in mind specific items to be covered:

1. Nature and extent of damage.
2. Number of occupants in damaged buildings.
3. Probable location of casualties.
4. Rescue operations already under way.
5. Presence of toxic gases or radioactive material.
6. Hazard from damaged utilities.
7. Buildings in danger of collapse.
8. Direction and rate of travel of uncontrolled fires.

In getting the above information, the rescuer can save effort by talking with people in the neighborhood. He should welcome information from:

1. Members of the warden service.
2. Bystanders and relatives.
3. Casualties able and willing to talk. Always double check information obtained from them.

A disaster situation calls for leadership. The leader must be calm, have perseverance and courage, and make full use of the knowledge gained through his training. Rescuers should provide such leadership.

The rescuer's best source of information probably will be the warden at the scene. He should know more about the habits of the people in the neighborhood than any other person.

After the disaster, rescuers may come in contact with relatives of trapped casualties. While some of the information received from relatives may not be correct, the rescuer must not pass up information no matter how small or insignificant it may be.

Casualties who have been rescued may be able to give information on the probable locations of other members of the family. A family member may be able to prevent unnecessary searching by informing rescuers of members who were away from home at the time of disaster.

Precautions that must be observed when searching damaged buildings:

1. Work in pairs.
2. Wear helmet (and goggles if available).
3. Always wear gloves.
4. Do not smoke or strike matches.
5. Avoid touching loose electric wires.
6. Avoid walking across middle of floor when searching upper stories of buildings.
7. Disturb debris as little as possible to avoid further collapse.

## LESSON PLAN NO. 7

COURSE: Basic Rescue—Course No. 14.1

LESSON TITLE: Reconnaissance

TIME: 2 hours

**TRAINING MATERIALS:**

Blackboard, chalk, eraser  
Model of rescue facility, optional  
Rescue training facility


**REFERENCE:**

*Rescue Techniques and Operations*, FCDA, TM-14-1, chapter 6, page 113

**MOTIVATION:**

Much can be done to locate trapped persons if reconnaissance is undertaken in a systematic and logical manner.

MAIN TOPICS	TEACHING POINTS
A. DEFINITION	<ol style="list-style-type: none"> <li>1. Reconnaissance is a systematic procedure of gathering facts in making an analysis of a situation. It is continuous, thorough, accurate, and rapid.</li> <li>2. Reconnaissance forms a basis for decisions on manpower, equipment required, and techniques and methods to be employed. It eliminates waste motion and promotes safety.</li> </ol>
B. How RECONNAISSANCE IS ACCOMPLISHED	<ol style="list-style-type: none"> <li>1. Information from:               <ol style="list-style-type: none"> <li>a. Local survivors.</li> <li>b. Other civil defense services on scene (warden, fire, police).</li> <li>c. Rescued casualties.</li> </ol> </li> <li>2. Observation by:               <ol style="list-style-type: none"> <li>a. Rescuers trained and qualified to analyze collapse.</li> <li>b. Rescuers trained in making decisions on extricating casualties.</li> <li>c. Rescuers who may need additional help.</li> </ol> </li> <li>3. Silence and listening period. Technique employed for locating casualties in debris.</li> </ol>

MAIN TOPICS	TEACHING POINTS
C. TERMINATION OF RECONNAISSANCE	<p>1. Indicated by marking the searched building.</p> <p>a. When rescuer is satisfied all casualties have been removed from a building, the building should be so marked to eliminate duplication of effort.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Date of search      Details of danger</p> <p>b. The "D" warns people of danger. The "R" indicates the service which has completed the search.</p> <p>c. In cases where the warden service has made the final search they would use the letter "W" in place of the "R"; engineers use the letter "E"; police use the letter "P"; and fire uses the letter "F".</p>

#### STUDENT PARTICIPATION:

Instructor should ask trainees questions about the course. Under the direction of the instructor the class should make a reconnaissance with casualty placed in the debris.

#### HANDOUT MATERIALS AVAILABLE:

None.

## **LESSON AIDS**

### **8—Care and Use of Ladders (Part I)**

A ladder made of wood, metal, or rope may be used by the rescuing party in the absence of stairways.

Rescuers must know the capabilities of the ladder. The ladder's maximum usefulness depends on its size, strength, type, and care.

Practice in the proper procedure in ladder handling minimizes unnecessary motion.



## LESSON PLAN NO. 8

COURSE: Basic Rescue, Course No. 14.1  
 LESSON TITLE: Care and Use of Ladders (Part I)

TIME: 1 hour

### TRAINING MATERIALS:

- Two 10' wall ladders per class
- Two 28' extension ladders per class
- Two  $\frac{3}{4}$ " x 100' manila ropes
- One  $\frac{1}{2}$ " x 50' rope per trainee
- One facility with second story windows
- Two pairs iron stakes

### REFERENCE:

*Rescue Techniques and Operations*, FCDA, TM-14-1, chapter 2, pp. 23-29, chapter 4, p. 101.

### MOTIVATION:

Rescuers must know how to care for, and handle ladders. Practice will make them proficient in their use. This lesson covers the proper handling and placing of ladders.

MAIN TOPICS	TEACHING POINTS
A. PURPOSE	To give trainees an understanding of the care, handling, placing, and climbing of ladders.
B. LADDER USES	Important rescue tool used for: <ol style="list-style-type: none"> <li>a. Entrance into upper story windows.</li> <li>b. Rescue from upper story windows or basements.</li> <li>c. Improvised stretcher.</li> <li>d. Bridging gaps.</li> </ol>
C. TERMINOLOGY	<ol style="list-style-type: none"> <li>1. Wall ladder—a ladder of only one section.</li> <li>2. Extension ladder—a ladder of two sections, one the bottom ladder known as the bed, and the other the fly or extension part of the ladder with guide pawls and a lanyard to raise the ladder.</li> <li>3. Beam—structural members in which rungs are supported.</li> <li>4. Rungs—cross members between the beams used as steps.</li> <li>5. Bed of extension ladder—the lowest section of an extension ladder.</li> <li>6. Fly of extension ladder—the upper or movable section of an extension ladder.</li> <li>7. Heel or butt—the bottom end of a ladder.</li> <li>8. Top, tip, or head—the top of a ladder.</li> <li>9. Fly rope, lanyard, halyard—the rope used in hoisting the fly.</li> <li>10. Pulley—small wheel over which the lanyard passes.</li> <li>11. Heelplate—a metal reinforcement at butt end of ladder.</li> </ol>


MAIN TOPICS	TEACHING POINTS
	<p>12. Dog—a lock used to support the fly after it is raised.</p> <p>13. Tie rods—metal rods which hold the entire ladder assembly together.</p> <p>14. Lanyard anchor—the device by which the lanyard is fastened to the bed ladder.</p>
D. CONSTRUCTION MATERIAL	<p>1. Ladder beams are usually made from fir or spruce.</p> <p>2. Ladder rungs are made of second growth hickory or ash.</p>
E. PRECAUTIONS AND CARE	<p>Ladders should be:</p> <ol style="list-style-type: none"> <li>1. In first class condition.</li> <li>2. Carefully inspected.</li> <li>3. Kept clean.</li> <li>4. Handled with care.</li> <li>5. Not overloaded.</li> <li>6. Kept unpainted. (Paint covers up defects.)</li> </ol>
<p>F. LIFTS AND CARRIES</p> <ol style="list-style-type: none"> <li>1. ONE-MAN WALL LADDER</li> <li>2. TWO-MAN EXTENSION LADDER</li> <li>3. FOUR-MAN EXTENSION LADDER</li> </ol>	<p>Demonstrate and practice with 10' wall ladder.</p> <p>Demonstrate and practice in small groups.</p> <p>Demonstrate and practice in small groups.</p>
	

FIGURE 17.—Safe ladder climbing position.

MAIN TOPICS	TEACHING POINTS
<p>G. LADDER PLACING AND CLIMBING</p> <p>ONE-MAN RAISE</p> <p>TWO-MAN RAISE AND LOWER</p> <p>EXTENSION LADDER</p> <p>THREE-MAN RAISE AND LOWER EXTENSION LADDER</p> <p>CLIMBING LADDERS</p>	<ol style="list-style-type: none"> <li>1. Explain formula for correct distance of heel from wall.</li> <li>2. Demonstrate and practice with 10' ladder.</li> </ol> <p>Demonstrate and practice..</p> <p>Demonstrate and practice.</p> <p>Demonstrate and practice climbing and leg lock.</p> <div data-bbox="671 592 952 1071" data-label="Image"> </div> <p>FIGURE 18.—Ladder leg lock.</p>

**STUDENT PARTICIPATION:**

1. Have trainees go through all steps in handling ladders.
2. Select a trainee to review nomenclature of ladders.
3. Insist on use of proper terms.

**HANDOUT MATERIALS AVAILABLE:**

None.

## LESSON AIDS

### 9—LIFTING DEVICES

The purpose of mechanical lifting devices is to make the work of the team as easy as possible. Manual lifting is hard work; it can injure the rescuer. When manual lifting is necessary, the rescuer should do it cautiously to prevent injury to his back.

Only the most common mechanical lifting devices will be discussed in this course. The choice of lifting device will depend on:

1. Availability of device.
2. Limitations of the device.
3. Type of obstacle to be lifted or moved.

The lever is the simplest appliance for gaining mechanical advantage. The ordinary crowbar is the form most frequently used by the rescuer.

Two well known types of jacks are the screw jack and the ratchet jack. In the screw type a lever is used to rotate the screw which in turn raises the load. The smaller the distance which the load is raised by one rotation of the screw, the less the effort required to raise the load. The screw jack is compact and safe in operation, and is preferable to the ratchet jack since the latter tends to disturb debris and does not give an even lift. Instructor should demonstrate the meaning of this statement.

Other devices mentioned in this course will be used for more advanced rescue.

## LESSON PLAN NO. 9

COURSE: Basic Rescue, Course No. 14.1

LESSON TITLE: Lifting Devices

TIME: 1 hour

### TRAINING MATERIAL:

Blackboard, chalk, and eraser

Pry bars

Screw jacks

Ratchet jacks

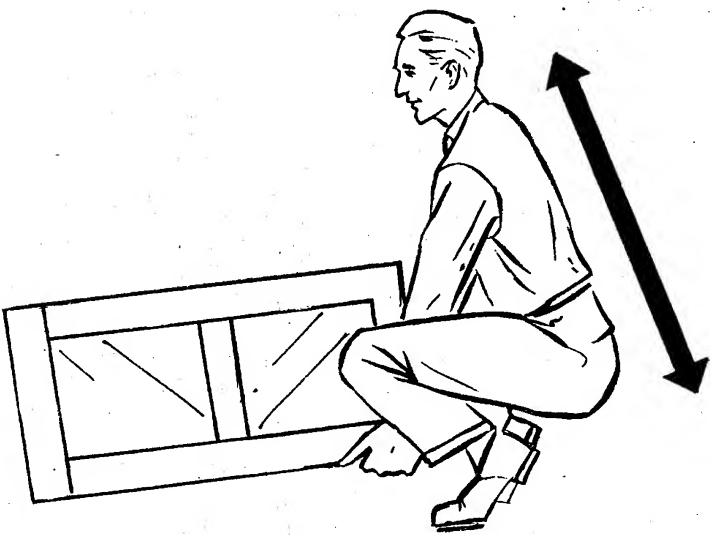
### REFERENCE:

*Rescue Techniques and Operations*, FCDA, TM-14-1

### MOTIVATION:

Rescue often involves the lifting of heavy objects to remove trapped people. The average man can manually lift only about 80% of his own weight. Therefore, he must know how to use mechanical devices.

MAIN TOPICS	TEACHING POINTS
A. MANUAL LIFTING	<ol style="list-style-type: none"> <li>Muscular energy—the average person should not attempt to lift more than 80% of his own weight.</li> <li>Demonstrate and discuss correct position in lifting: <ol style="list-style-type: none"> <li>Squat.</li> <li>Balance properly.</li> <li>Grasp object.</li> <li>Keep back straight—not necessarily vertical.</li> <li>Keep feet together.</li> <li>Lift evenly.</li> <li>Let legs take the load.</li> <li>Keep load clear of feet.</li> <li>Reverse procedure for lowering.</li> </ol> </li> </ol>
B. MECHANICAL LIFTING	<ol style="list-style-type: none"> <li>Needed when object is: <ol style="list-style-type: none"> <li>Too heavy for manual lifting.</li> <li>Bulky.</li> <li>Difficult to grasp firmly.</li> </ol> </li> <li>Mechanical advantage—ratio of load moved to effort employed.</li> <li>Machine—a device that simplifies and speeds up work.</li> </ol>
C. TERMS	
D. LEVER	<ol style="list-style-type: none"> <li>Standard forms of levers: <ol style="list-style-type: none"> <li>Pinch point crowbar.</li> <li>Claw end wrecking bar.</li> <li>Pick.</li> <li>Any substantial section of lumber.</li> </ol> </li> <li>Uses of levers: <ol style="list-style-type: none"> <li>Lift objects.</li> <li>Move objects.</li> <li>Prevent movement of objects.</li> </ol> </li> </ol>

MAIN TOPICS	TEACHING POINTS
E. JACKS	<p>3. Mechanical advantage of levers. Demonstrate and explain formula in TM-14-1, fig. 26, p. 30.</p> <p>4. Precautions:</p> <ol style="list-style-type: none"> <li>Material for fulcrum of solid material (preferably timber).</li> <li>Position of body weight.</li> <li>Packing and cribbing.</li> <li>Danger of slipping.</li> <li>Keeping feet and hands from under load.</li> </ol> <p>Demonstrate.</p> <p>1. For rescue there are basically two types:</p> <ol style="list-style-type: none"> <li>Screw jack— operates on principle of inclined plane.</li> <li>Ratchet jack—operates on principle of lever working against ratchet.</li> </ol> <p>2. Uses:</p> <ol style="list-style-type: none"> <li>To lift or lower when used vertically.</li> <li>To move or hold when used horizontally.</li> </ol> <p>Demonstrate and discuss uses, advantage, and limitations of both jacks.</p> <p>3. Precautions:</p> <ol style="list-style-type: none"> <li>Work from a good foundation.</li> <li>Pack as you jack (use wedge as a safety chock).</li> <li>Never leave a jack under load—it may slip.</li> <li>Inspect and test jacks regularly. They should be oiled and greased.</li> <li>Raise or lower all jacks in unison and slowly when using several jacks on one load.</li> </ol>
	 <p>Figure 19.—Manual lifting.</p>

MAIN TOPICS	TEACHING POINTS
	<ul style="list-style-type: none"> <li>f. Avoid letting jack contact any material except wood. This can be accomplished by using wood packing between the cap of the jack and the load to be lifted.</li> <li>g. Fit jack handle snugly into socket.</li> <li>h. Remove jack handle when not in use.</li> <li>i. Avoid overloading or over-extending jack.</li> </ul>

#### STUDENT PARTICIPATION:

After instructor discusses and demonstrates a device, each trainee should go through the process.

#### HANDOUT MATERIALS AVAILABLE:

Many jack manufacturing companies supply pamphlets upon request. Instructors may obtain handout material by applying to them.

## **LESSON AIDS**

### **10. Appreciation of Damage to Buildings**

Bomb-blasted buildings of the same class and type of construction collapse in much the same way and common factors are present. Rescuers should study these factors for their value when extricating casualties.

The rescuers should study the form and layout of buildings before attempting rescue. Rescuers directing operations should visit and examine as many buildings in their area as possible, observing construction and general layout points that may be of assistance if rescue operations in those buildings ever become necessary.



## LESSON PLAN NO. 10

COURSE: Basic Rescue—Course No. 14.1

LESSON TITLE: Appreciation of Damage to Buildings

TIME: 1 hour

### TRAINING MATERIALS:

Blackboard, chalk, and eraser

Charts of various collapses, optional

Filmstrip projector and screen

Filmstrip: "Damage Survey for Rescue Workers"

### REFERENCE:

*Rescue Techniques and Operations*, FCDA, TM-14-1.

### MOTIVATION:

The rescuer should know the principles, techniques, and materials of construction to anticipate conditions after collapse.

MAIN TOPICS	TEACHING POINTS
A. PURPOSE	<ol style="list-style-type: none"><li>1. To teach trainees the effects of bombing on different types of construction.</li><li>2. To assist in:<ol style="list-style-type: none"><li>a. Location of survivors.</li><li>Selection of potential strong points and voids.</li><li>b. Safety of operations.</li><li>Compare shoring and dismantling.</li><li>c. Selection of points and methods of entry or exit.</li><li>d. Selection of proper tools.</li></ol></li></ol>
B. FORCES AFFECTING STRUCTURES	<ol style="list-style-type: none"><li>1. Blast—transmitted through air, subjecting structures to giant blow.</li><li>2. Earth shock—transmitted through ground, giving effect of earthquake.</li><li>3. Fire effects:<ol style="list-style-type: none"><li>a. Extensive damage to nonfireproof buildings.</li><li>b. Secondary fires from disrupted utilities.</li><li>c. Fire storm possibility.</li></ol></li><li>4. Wind effects—air drag follows shock front.</li><li>5. Fragmentation—damaged by falling debris.</li></ol>

MAIN TOPICS	TEACHING POINTS
C. RESISTANCE FACTORS	<ol style="list-style-type: none"> <li>1. Strength:               <ol style="list-style-type: none"> <li>a. Strength of materials (steel, concrete, timber).</li> <li>b. Connections (welded, riveted, nailed).</li> <li>c. Bracings.</li> <li>d. Resilience.</li> </ol> </li> <li>2. Anchorage—secureness to foundation.</li> <li>3. Openings—doors, windows.</li> <li>4. Size and shape.</li> <li>5. Distance from explosion.</li> <li>6. Shielding (by structures and topography).</li> <li>7. Angle of blast (broadside or at angle).</li> </ol>
D. TYPES OF CONSTRUCTION	<p>Two general types:</p> <ol style="list-style-type: none"> <li>1. Unframed (load-bearing walls)—small apartment and individual home.               <ol style="list-style-type: none"> <li>a. Walls support floors and roof.</li> <li>b. Generally masonry or veneer.</li> </ol> </li> <li>2. Framed—large multistoried (hotels, hospitals, office buildings, schools, or warehouses).               <ol style="list-style-type: none"> <li>a. Steel or wood reinforced concrete skeleton.</li> <li>b. Frame supports floors and roof.</li> </ol> </li> </ol>
E. DAMAGE EFFECTS	<ol style="list-style-type: none"> <li>1. Unframed buildings.               <ol style="list-style-type: none"> <li>a. Blast (extensive damage).                   <ol style="list-style-type: none"> <li>(1) Pressure on walls and roof.</li> <li>(2) Collapse of walls resulting in collapse of building.</li> <li>(3) Weak construction unable to resist pressures.</li> <li>(4) Large openings permit rapid equalization of pressures.</li> </ol> </li> <li>b. Earth shock (extensive damage).                   <p>Walls collapse due to weak anchorage and lack of bracing.</p> </li> <li>c. Fire; susceptibility to fires.</li> <li>d. Wind, extensive damage due to inadequate bracing.</li> <li>e. Fragmentation, extensive damage, and heavy debris from collapse of load-bearing walls.</li> </ol> </li> </ol> <p>Demonstrate and explain collapse patterns.</p> <p>“V” shaped collapse (debris and voids). See TM-14-1, fig. 94, p. 108.</p> <p>Lean-to collapse (concentration of debris and voids). See TM-14-1, fig. 92, p. 107.</p> <p>Pancake collapse (debris and voids). See TM-14-1, fig. 93, p. 108.</p> <p>Multiple collapse (double “V”).</p> <p>Point out the strong points of resistance and where people may be trapped and alive. Discuss the importance of building construction in effective reconnaissance and approach to rescue operation.</p>

MAIN TOPICS	TEACHING POINTS
	<p>2. Framed buildings—floors and roof depend on skeleton frame for support. This frame is made up of steel and reinforced concrete. The destructive forces are:</p> <ul style="list-style-type: none"> <li>a. Blast—comparatively light damage to frame. <ul style="list-style-type: none"> <li>(1) Collapse of wall does not cause collapse of building.</li> <li>(2) Strong floor construction adds to strength.</li> <li>(3) Large openings permit rapid equalization of pressure.</li> </ul> </li> <li>b. Earth shock—comparatively light damage to frame. <ul style="list-style-type: none"> <li>(1) Wall collapse does not weaken frame.</li> <li>(2) Strong anchorage.</li> <li>(3) Strong bracing.</li> </ul> </li> <li>c. Fire—usually fireproof. <ul style="list-style-type: none"> <li>(1) Steel usually fireproof with masonry.</li> </ul> </li> <li>d. Wind—little or no damage. <ul style="list-style-type: none"> <li>(1) Built to resist winds.</li> <li>(2) Well braced.</li> </ul> </li> <li>e. Fragmentation—light damage.</li> </ul>

**STUDENT PARTICIPATION:**

Question and answer period.

**HANDOUT MATERIALS AVAILABLE:**

None.

## LESSON AIDS

### 11—Basic Fire Fighting and Limitations

To tackle a fire first make a rapid survey. In making this fire survey get close to the floor where there will be more cool air, better visibility, and less heat and smoke than at a higher level.

Fire will be extinguished by cooling with water and by keeping the supply of oxygen to a minimum. Close doors, windows, and other openings. Remove all combustible material. Investigate for more than one fire source.

Extinguish the fire quickly or it will spread. Attack the heart of the fire rather than the flames, remembering that all combustible material near a fire is a potential fire.

If more than one pump tank is available, use the others to reinforce the first or to attack the fire from more than one direction to prevent it from spreading.

Cool all fire with water to ensure that there are no hot spots which may flare up after the fire fighters have left.

The object at all times should be to save lives and to extinguish fires no matter what complications there may be.

If the fires are too large for the equipment available, additional help should be summoned. This could be true for an atomic bombing where fires may start simultaneously in all parts of a building. Additional dangers may call for other fire fighting techniques.

#### MAGNESIUM

Tackle a fire caused by a magnesium-thermite type of incendiary bomb the same way as outlined for other fires. The area around the bomb should be wet down constantly to avoid sputtering of magnesium away from the fire fighter and starting other fires.

If the bomb has been burning for some time, sputtering may have stopped and it may be reduced to a molten puddle of magnesium. The fires started by the bomb must be attacked with water at once. The main danger from the molten bomb will be burning through the floor boards.

Incendiary bombs may be fitted with explosive attachments; therefore, when fighting a fire caused by these bombs, full advantage should be taken of any available cover. Even so, the risk must be accepted and the fire tackled regardless of possible injury.

#### OIL

If oil is used, the resulting fires may be attacked with class B extinguishing agents. In addition, they should be smothered with sand or blanketed with a fine spray of water. Spraying has the additional advantage of cooling.

#### DO

1. To force a door break a panel near the lock.
2. Shut off the gas supply if gas mains are on fire. Do not attempt to extinguish.
3. Pull electric switches or remove fuses when room or building is on fire.
4. When searching a house start at the top and work downward.
5. Keep doors and windows closed to exclude oxygen.
6. Crawl, don't walk, when in thick smoke.
7. Keep near walls, where floor and stairs are strongest.
8. Attack fires at closest possible range.
9. Attack the heart of a fire.
10. Attack oil fires with sand, earth, or class B extinguishers.
11. Be sure that all fires are out before leaving scene.
12. Keep all fire fighting appliances in perfect condition.
13. Keep ample supplies of water.
14. Make a note of the nearest fire station and emergency water supplies, e. g., ponds, rivers, etc.

## DON'T

1. Go alone into a smoke-filled building without the safety line and a man standing by on the outside.
2. Enter a burning building or room without fire-fighting appliances except to save lives.
3. Play water on electric wiring.
4. Use matches or open flame to see.

## LESSON PLAN NO. 11

COURSE: Basic Rescue—Course No. 14.1

LESSON TITLE: Basic Fire Fighting and Limitations

TIME: 1 hour

### TRAINING MATERIALS:

Blackboard, chalk, eraser

Chart of fire extinguishers

Table for displaying extinguishers

The following extinguishers: Carbon tetrachloride, soda-acid, foam, CO<sub>2</sub>, pump can, sturup pump, dry powder

Class A and B fires (class C if practical)

### REFERENCES:

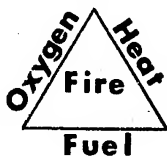
*Fire Fighting for Householders*, FCDA, PA-4.

*Water vs. Fire*—Forest Service—U. S. Department of Agriculture

### MOTIVATION:

Regular fire fighters may not be available when needed at the site of rescue operations. Therefore, rescue workers must extinguish or control small fires to:

1. Protect trapped casualties.
2. Permit entry and search of buildings.
3. Permit rescue operations.
4. Prevent trapping of rescue workers.

MAIN TOPICS	TEACHING POINTS
A. THREE ESSENTIALS OF FIRE	<p style="text-align: center;">The triangle of fire</p> <div style="text-align: center;">  </div> <p>Fuel, oxygen, heat form a closed triangle corporation called FIRE. If one or more of these members is removed, the fire no longer will burn. This is the basis for fire extinguishment.</p>
B. CLASSIFICATION OF FIRES	<ol style="list-style-type: none"> <li>1. Class A—fires in ordinary combustible material such as wood, paper, trash, rubber, cloth, etc. Extinguish by quenching with water (cooling).</li> <li>2. Class B—fires in flammable liquids such as gasoline, oil, grease, paint, tar, etc. Extinguish by smothering. A blanket of foam or heavy noncombustible gas such as carbon dioxide will, if applied properly, put out class B fires. Dry chemical will also put out these fires.</li> </ol>

MAIN TOPICS	TEACHING POINTS
<p>C. FIRST AID FIRE EXTINGUISHERS</p> <p>D. HANDLING</p>	<p>3. Class C—fires involving electrical wiring, apparatus, or equipment. This class of fire may be smothered with carbon dioxide or vaporizing liquid without damage to equipment. Dry chemicals may also be used to put out fires in certain types of electrical equipment.</p> <p>1. Give trainees a chart of fire extinguishers.</p> <p>2. Display each type of extinguisher and discuss its limitations. Display only one at a time. If time permits, disassemble the soda-acid and foam extinguishers.</p> <p>Start various types of fires and have trainees use different types of extinguishers.</p>

#### STUDENT PARTICIPATION:

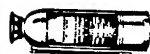
Question and answer period and practice.

#### HANDOUT MATERIALS AVAILABLE:

Fire fighting equipment companies supply pamphlets upon request. Instructors may obtain handout material by applying to them.

# The ABC of Fires and Fire Protection

KNOW YOUR EXTINGUISHERS AND HOW TO USE THEM



Each class of fire calls for specialized action. Using the wrong extinguisher may do more harm than good. For your own protection, you should know these five basic types, how to use them, and why.

CLASS	TYPE	CARBON DIOXIDE	DRY CHEMICAL	FOAM	WATER	V-L
<b>CLASS A FIRES</b> Paper, wood, cloth, etc. where quenching and cooling effect of water is required.		<b>YES</b> Excellent Small surface fires only.	<b>YES</b> Excellent Small surface fires only.	<b>YES</b> Excellent Foam has both smothering and wetting action.	<b>YES</b> Excellent Water extinguishes material and prevents rekindling.	<b>YES</b> Excellent Small surface fires only.
<b>CLASS B FIRES</b> Burning liquids (gasoline, oil, paint), cooking fat, etc., where smothering action is required.		<b>YES</b> Excellent Carbon dioxide leaves no residue, does not affect equipment or food.	<b>YES</b> Excellent Chemical releases smothering gas on fire and shields operator from heat.	<b>YES</b> Excellent Smothering blanket floats on top of liquid.	<b>NO</b> Water will spread fire, not put it out.	<b>YES</b> Excellent Releases heavy smothering gas on fire.
<b>CLASS C FIRES</b> First in live electrical circuits (switches, appliances, etc.) where a non-conducting extinguishing agent is required.		<b>YES</b> Excellent Carbon dioxide is a non-conducting gas, leaves no residue, will not damage equipment.	<b>YES</b> Excellent Chemical is a non-conducting gas, shields operator from heat.	<b>NO</b> Foam is a conductor and should not be used on live electrical equipment.	<b>NO</b> Water, a conductor, should not be used on live electrical equipment.	<b>YES</b> Excellent Liquid is a non-conducting gas, shields equipment.
<b>HOW TO OPERATE</b>						
<b>RANGE OF STREAM</b>		Unhook hose, pull out lock pin, squeeze trigger or turn hand wheel. Discharge at base of fire. 3 to 6 feet.	Unhook hose, pull out lock pin, squeeze trigger. Discharge dry chemical right into fire. 8 to 12 feet.	Turn over, bump on ground. Aim at base of wood fire. Float foam on top of liquid fire. 30 to 40 feet.	Turn over. Bump on ground to create pressure. Suck burning material. 40 to 50 feet.	Unhook by turning handle. Pump stream on burning material. 20 to 30 feet.
<b>PRESSURE SOURCE</b>		Gas compressed in cylinder.	Gas from pressure cartridge.	Gas from pressure cartridge.	Gas from soda-acid reaction.	Hand pumping.
<b>PRINCIPAL EXTINGUISHING AGENT</b>		Carbon Dioxide Gas.	Heptachlorobenzene powder, plus carbon dioxide gas generated from powder by fire.	Flowing blanket of durable bubbles filled with inert gas.	WATER	Heavy vapor produced from liquid by heat of fire.
<b>RATED CAPACITY (most common sizes)</b>		2½, 5, 10, 15, 20 and 25 pounds net weight of gas.	20 and 30 pounds net weight of powder.	2½ gallons.	2½ gallons.	1 and 1½ quarts.
<b>QUANTITY OF EXTINGUISHING AGENT PRODUCED</b>		Approximately 9 cu. ft. for each pound of gas.	Amount of gas generated depends on heat of fire.	20 to 22 gallons.	2½ gallons.	Amount of vapor depends on heat of fire.
<b>PRINCIPAL EXTINGUISHING EFFECT</b>		Smothering (keeping out oxygen).	Smothering and cooling.	Smothering and cooling.	Quenching and cooling.	Smothering and cooling.
<b>RECHARGING PERIOD</b>		AFTER USE (weigh annually to detect loss from tampering, etc.).	AFTER USE (weigh CO <sub>2</sub> cartridge annually).	Discharge and recharge annually.	Keeps filled with water and weigh cartridge yearly.	Annually.
<b>EFFECT OF FREEZING TEMPERATURE ON OPERATION</b>		Will operate at minus 40°F.	Will operate at minus 40°F.	Excess. Will not operate below 32°F.	Freezes. Will not operate below 40°F.	Will operate at minus 48°F.



## LESSON PLAN NO. 12

COURSE: Basic Rescue—Course No. 14.1

LESSON TITLE: Rescue Exercise

TIME: 2 hours

### TRAINING MATERIALS:

Will depend on how extensive the exercise is to be.

### REFERENCES:

All previous lessons and notes.

MAIN TOPICS	TEACHING POINTS
A. PURPOSE	1. To test efficiency of trainees.
B. SCOPE	2. To test trainees' knowledge of civil defense. Type of exercise will depend on:
	1. Size of class.
	2. Facilities available.
	3. Instructor personnel available.
	4. Time: day or night.
C. PREPARATION	1. Steps
	a. Decide types of skills to be used.
	b. Source of casualties—rescue real people if possible.
	c. Outline the procedure.
	d. Write the narrative.
	e. Carefully select the persons to be rescued.
	f. Rehearse with casualties.
	2. Time schedule—schedule time for each incident so problem doesn't drag.
	3. Responsibilities
	a. Instructor's role.
	b. Trainee's responsibility.
	4. Briefing—brief all trainees thoroughly.
D. EXERCISE	1. Warning alerts.
	2. Reporting to scene.
	3. Sequence of incidents.
	4. Conclusion of exercise.
	5. Instructor's comments.
	6. Trainees' comments.
E. EVALUATION	Discuss whether the exercise accomplished its purpose.

### STUDENT PARTICIPATION:

Trainees practice the knowledge, skills, and techniques learned during the course.

### ADDITIONAL TRAINING MATERIALS:

None.

## REFERENCES

1. *Air Raid Alert Signal Instruction Card*, FCDA, 1955.
2. *Air Raid Evacuation Signal Instruction Card*, FCDA, 1955.
3. *American Red Cross First Aid Textbook and Supplement No. I*, (The Blakiston Company), Philadelphia, Pa.
4. *Basic Course for Civil Defense*, FCDA, Pub. IG-3-2, 1955, 30 cents, 44 pp.
5. *Civil Defense Instructor's Course*, FCDA, Pub. IG-3-3, 1956.
6. *Organization and Operation of Civil Defense Casualty Services, Part III, Medical Records for Casualties*, FCDA, Pub. TM-11-3, 1953, 20 cents, 36 pp.
7. *Rescue Techniques and Operations*, FCDA, Pub. TM-14-1, 1953, 40 cents, 127 pp.
8. *Skills Training Films*, (Rescue, Fire Fighting, Emergency First Aid) FCDA, Pub. IG-3-1, 1954, 60 cents, 164 pp.
9. *Water vs Fire—Forest Service*—U. S. Department of Agriculture.

## Recent FCDA Publications

*Facts About the H-Bomb* (leaflet), 1955.

*Facts About Fallout* (leaflet), 1955.

*Evacuation Checklist*, Pub. TB-27-2, 1955.

*Evacuation of Civil Populations in Civil Defense Emergencies*, Pub. TB-27-1, 1955.

*Needed — Home Nursing for Civil Defense*, Pub. PG-11-1, 1955.

*Planning and Organizing for Civil Defense Traffic Operations*, Pub. TM-27-2, 1955.

*Procedure for Evacuation Traffic Movement Studies*, Pub. TM-27-1, 1955.

*Six Steps to Survival* (leaflet), 1955.

*States, Counties, Cities, and Civil Defense*, Booklet, 1955.

*The Problem of Panic*, Pub. TB-19-2, 1955.

*The Radioactive Fallout Problem*, Pub. TB-19-1, 1955.

*The Role of the Warden in the H-Bomb Era*, Pub. TB-27-3, 1955.

*What You Should Know About Radioactive Fallout*, Pub. PA-7, 1955.